

REMARKS

This amendment is being filed in response to the Office Action dated December 19, 2005. Applicant hereby requests a three-month extension of time and encloses the corresponding fee. If any further extension or fee may be required for consideration of this amendment, such is hereby requested. Please charge any deficit or credit any surplus to Deposit Account No. 01-1960.

The application was filed with original Claims 1-12. Applicant has amended Claims 1, 11, and 12, has cancelled claims 2-3 and 5-6, and has added new Claims 13-16 such that Claims 1, 4, 7-12, and 13-16 are now pending. Applicant respectfully requests reconsideration of the pending claims based on the above amendments and the following remarks.

Specification

Applicant has made a number of minor changes to the specification in order to correct a few transcription errors that crept into the text.

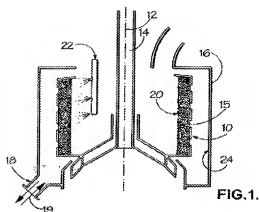
Applicant has also amended Paragraph [0008], without adding new matter, in order to include an explicit reference to "the perforated outer surface" of basket 10, as is implicit in the original drawings, so that there is explicit support for such language within amended Claims 1, 11 and 12.

Generally

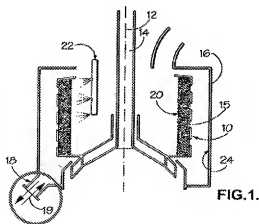
The invention is generally directed to an industrial centrifuge for separating liquids and solids. The main purpose of the invention is to strategically locate a transducer on an inner surface of the casing that faces the perforated outer surface of the basket in order to monitor, without delay, the separated and contaminated liquids discharged from a centrifugal basket.

Moreover, depending on its electrode configuration relative to the depth d of the liquids, the strategically located transducer can establish a signal that is representative of % contamination, a control signal that is representative of depth, or both (see e.g. Figure 10).

Figure 1 shows a centrifuge that does not include but might benefit from the invention. In the illustrated centrifuge, a wash pipe 22 sprays a wash liquid onto a solid 20 contained in perforated basket 10. The perforated basket 10 rotates within a fixed casing 16 so that a centrifugal force is applied to the liquids and the solids 20. Then, because of a screen 15 associated with the spinning basket 10, the liquids but generally not the solids 20 spray onto an inner surface 24 of the casing 16, spiral downward on the inner surface 24, and ultimately drain away from the centrifuge through an outlet pipe 18:

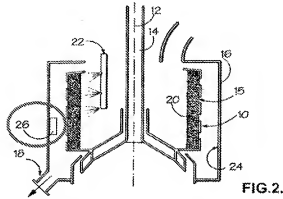


As noted in the "Background of the Invention" section of the application, especially paragraphs [0010] and [0011], the invention is generally directed to reducing the problem of over washing due to the state of the wash liquid not being measured until, after some delay, it reaches measurement location 19 in outlet pipe 18. According to the inventor, after impinging on the inner surface 24 of the casing 16, it typically takes another 5 to 30 seconds for the wash liquid to spiral downward and reach the outlet pipe 18 and associated sensor 19:



The primary solution to this problem was moving the associated conductivity sensor 26 further upstream from measurement location 19 to a

location on the inner surface 24 of the fixed casing 16 and adjacent to the spinning basket 10:



By locating the sensor 26 in this position, rather than further downstream in the outlet pipe 18, the conductivity reading that is representative of the state of the wash fluid is made much sooner than before, i.e. as soon as possible after the separated liquids first impinge and flow down the inner surface of the fixed casing which surrounds the rotating basket.

Claims 1, 11 and 12 – Leung '897

The Office Action rejects independent Claims 1, 11 and 12 under 35 U.S.C. 102(b) as anticipated by Leung '897. Applicant respectfully traverses based on the amendments to Claim 1, 11, and 12 and the following remarks.

Applicant has carefully amended independent Claims 1, 11 and 12 to read as follows:

1. (Currently Amended) An apparatus for the separation of solids and liquids comprising:
a perforated basket which is mounted rotatably within a fixed outer casing, said perforated basket having a perforated outer surface through which liquids are centrifugally expelled from the basket, said fixed outer casing having an inner surface that faces the

perforated outer surface of the perforated basket and receives the liquids centrifugally expelled from the basket.

- a washing liquid supply means for providing washing liquid to the basket and its contents, and
- a transducer for establishing a control signal representative of the state of liquids centrifugally expelled from the basket, the transducer located in or on the inner surface of said fixed outer casing for monitoring the conductance of the liquids centrifugally expelled from the basket when such liquids impinge on and flow down the inner surface of said fixed outer casing, said transducer comprising at least two electrodes set in an electrically insulating material and having a distance therebetween.

11. (Currently Amended) An apparatus for the separation of solids and liquids comprising;

- a perforated basket which is mounted rotatably within a fixed outer casing, said perforated basket having a perforated outer surface through which liquids are centrifugally expelled from the basket, said fixed outer casing having an inner surface that faces the perforated outer surface of the perforated basket and receives the liquids centrifugally expelled from the basket.
- a washing liquid supply means for providing washing liquid to the basket and its contents,
- a transducer for establishing a control signal representative of the state of liquids centrifugally expelled from the basket, the transducer located in or on the inner surface of said fixed outer casing for monitoring the conductance of the liquids centrifugally expelled from the basket when such liquids impinge on and flow down the inner surface of said fixed outer casing, and
- an auxiliary wash pipe for cleaning the surfaces of the transducer and to facilitate calibrations.

12. (Currently Amended) An apparatus for the separation of solids and liquids comprising;

- a perforated basket which is mounted rotatably within a fixed outer casing, said perforated basket having a perforated outer surface through which liquids are centrifugally expelled from the basket, said fixed outer casing having an inner surface that faces the perforated outer surface of the perforated basket and receives the liquids centrifugally expelled from the basket.
- a washing liquid supply means for providing washing liquid to the basket and its contents,
- a transducer for establishing a control signal representative of the state of liquids centrifugally expelled from the basket, the transducer located in or on the inner surface of said fixed outer casing for monitoring the conductance of the liquids centrifugally expelled from the basket when such liquids impinge on and flow down the inner surface of said fixed outer casing, and
- a temperature sensing device to measure the temperature of the liquid and send a signal to adjust the generated output accordingly.

The Office Action rejects Claims 1, 11, and 12 as anticipated by Leung '897. Leung's claims focus on measuring cake height but, as the Office Action notes, Leung also discloses a "plethora" of signal producing sensors. However, even though Leung references numerous sensors used in a centrifuge, Leung does not disclose even one sensor that is located and structured as claimed. More particularly, Leung does not teach or suggest a multi-electrode transducer that is mounted in or on the inner wall of the casing that faces the perforated outer surface of the basket from which liquids are centrifugally expelled.

It is this unique structure that allows a centrifuge made according to the Applicant's claimed invention to prevent over washing by rapidly determining the state of the wash liquid, i.e. without the delay associated with downstream measurement like that shown in Figure 1.

Leung refers to parameters relating to "input and output *streams*" (e.g. column 8, lines 63-66, and column 9, lines 8-9), but this simply refers to inputs and outputs of the centrifuge on the whole, and is clearly not a reference to the liquids that are being centrifugally expelled from the centrifuge. Note also that while Leung does disclose one specific wall-related location (e.g. on the end walls of the basket, see column 10, lines 48-50), Leung does not teach or suggest that a transducer should be disposed on the inner wall of the casing to receive centrifugally expelled liquids sooner rather than later.

As to a potential combination with Joshi (which was cited against dependent Claims 2-10 in combination with another patent to Leung having the

same disclosure), applicant respectfully notes that Joshi does not include a basket having a perforated outer surface as required by Applicant's amended claims. To the contrary, as can be seen by reviewing the "turbine can" 5 in Joshi's Figure 1, the sidewall 20 and its entire outer surface 26 are completely solid.

Joshi does disclose an "electrical connection" 12 to the wall of the rotating can 5, but as confirmed by Figure 3, this is simply an input for the application of a voltage to the can 5, not a transducer. More importantly, Joshi does not disclose a transducer on the inner surface of the outer body 7.

Based on the foregoing, Applicant respectfully submits that amended Claims 1, 11, and 12 are not anticipated by Leung, and that they also are not obvious over a combination of Leung and Joshi.

Dependent Claims 4 and 7-10

Dependent Claims 4 and 7-10 are believed to add further patentable subject matter, but they are also allowable simply by virtue of their dependence from allowable Claim 1.

New Dependent Claims 13-16

Newly added Claims 13-16 focus on the relationship between the electrode spacing t and the prevailing depth of the liquids on the inner wall of the casing. In Claim 13, where $t < d$, the transducer outputs a control signal representative of the % contamination. In Claim 14, where $t > d$, the transducer

outputs a control signal representative of the depth of the liquids. And, in Claims 15 and 16, as is the case with the embodiment shown in Figure 10, the transducer contains electrodes separated by both distances t and T such that it selectably establishes a control signal representative of % contamination, depth, or both:

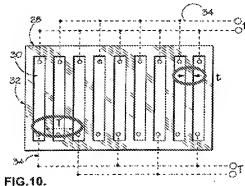


FIG.10.

Claims 13-16 are believed to add further patentable subject matter, but they are also allowable simply by virtue of their dependence from allowable Claim 1.

Summary

Based on the attached amendments and accompanying remarks, Applicant respectfully submits that the pending Claims 1, 4, 7-12, and 13-16 are in patentable condition and earnestly solicits a timely Notice of Allowance. Applicant encourages the Examiner to telephone the undersigned attorney if it appears that a telephone conference would further this case in any way.

Respectfully submitted,

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